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(54) Title: CONFERENCE MEMBER IDENTIFICATION FOR A TELEPHONE SYSTEM

(57) Abstract

Various telephone features are implemented for use during a conference call. In order to implement features, an identity of each party to the conference call is stored. An identity of a second party to the conference call is displayed on a display of a first telephone used by a first party to the conference call.

If the display on the first telephone is large enough, all the parties in the conference can be displayed. Alternatively, the first telephone displays only one party to the conference at a time. A scroll feature is used to scroll through all the parties to the conference. A private consultation may be conducted between the first party and the second party. In response to the first party depressing a consultation feature button on the first telephone, the first party and the second party are temporarily disconnected from the conference call, and are temporarily connected to each other in a point-to-point call. In response to the first party again depressing the consultation feature button on the first telephone, the first party and the second party are disconnected from the point-to-point call and reconnected to the conference call.

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CONFERENCE MEMBER IDENTIFICATION FOR A TELEPHONE SYSTEM

Background

The present invention concerns telephone systems and pertains
5 particularly to facilitating identification of members of a telephonic conference.

The use of telephone conferencing allows several individuals to
engage in conversation over the telephone lines. However, during a
telephone conference, as members are added, sometimes it can be difficult
for members of the telephone conference to keep track of who is taking part
10 in the conference. In addition, once a telephone conference is set up, if two
members of the conference desire to have a private consultation, it is
generally necessary for both of them to disconnect from the conference in
order to establish a separate connection for private consultation.

15 Summary of the Invention

In accordance with the preferred embodiment of the present invention,
various telephone features are implemented for use during a conference call.
In order to implement the features, an identity of each party to the conference
call is stored. For example, an identity and directory number of each party to
20 the conference call is stored within a database within a telephone system.

An identity of a second party to the conference call is displayed on a
display of a first telephone used by a first party to the conference call. If the
display on the first telephone is large enough, all the parties in the conference
can be displayed. Alternatively, the first telephone displays only one party to
25 the conference at a time. A scroll feature is used to scroll through all the
parties to the conference.

Various features are implemented between parties to the conference
call. For example, a private consultation may be conducted between the first
party and the second party. In response to the first party depressing a
30 consultation feature button on the first telephone, the first party and the
second party are temporarily disconnected from the conference call, and are
temporarily connected to each other in a point-to-point call. In response to

the first party again depressing the consultation feature button on the first telephone, the first party and the second party are disconnected from the point-to-point call and reconnected to the conference call.

Also, a callback feature between the first party and the second party
5 may be implemented. In response to the first party depressing a callback feature button on the first telephone, a callback between the first party and the second party is executed upon completion of the conference call and the first telephone being idle and a second telephone for the second party being idle.

10 Additionally, a message waiting feature may be implemented. In response to the first party depressing a message-waiting feature button on the first telephone, the telephone system indicates to the second party that there is a message waiting from the first party.

Further, a save re-dial feature can be implemented. In response to the
15 first party depressing a save re-dial feature button on the first telephone, the telephone system stores the directory number of the second party in a re-dial memory of the first telephone.

The various embodiments of the present invention allows for the implementation of versatile features for use by parties to a conference call.

20

Brief Description of the Drawings

Figure 1 shows a telephone system with the ability to provide conferencing of telephones in accordance with a preferred embodiment of the present invention.

25 Figure 2 shows a block diagram which illustrates the set-up of a conference.

Figure 3 shows data stored in a database for the conference illustrated in Figure 2 in accordance with a preferred embodiment of the present invention.

30 Figure 4, Figure 5, Figure 6, Figure 7 and Figure 8 show the information exhibited on a display as a user scrolls through members of a telephone conference in accordance with a preferred embodiment of the

present invention.

Figure 9 and Figure 10 show the information exhibited on displays as a user engages in a private consultation during a telephone conference in accordance with a preferred embodiment of the present invention.

5

Description of the Preferred Embodiment

Figure 1 shows a telephone system 20 which is capable of providing connections for a telephone conference in accordance with a preferred embodiment of the present invention. Telephone system 20 is, for example, a
10 public or private network telecommunication system.

Connected to telephone system 20, whether directly or indirectly through other switches, are a telephone 31, a telephone 36, a telephone 41 and a telephone 46. While Figure 1 shows only telephones 31, 36, 41 and 46, these are representative of any number of telephones which may be
15 directly or indirectly connected to telephone system 20. While each of telephones 31, 36, 41 and 46 may have a variety of features and configurations, when utilized according to embodiments of the present invention, at least one of telephones 31, 36, 41 and 46 will have a display.

For example, telephone 31 includes a display 32. In addition,
20 telephone 31 has a feature button 33, a feature button 34 and a feature button 35. Telephone 36 includes a display 37. In addition, telephone 36 has a feature button 38, a feature button 39 and a feature button 40. Telephone 41 includes a display 42. In addition, telephone 41 has a feature button 43, a feature button 44 and a feature button 45. Telephone 46 includes a display
25 47. In addition, telephone 46 has a feature button 48, a feature button 49 and a feature button 50. Displays 32, 37, 42 and 47 are, for example, light emitting diode (LED) displays. Alternatively, displays 32, 37, 42 and 47 may be liquid crystal diode (LCD) displays or another type of display. While the description herein describes the use of feature buttons, the invention also
30 may be implemented, for example, using the buttons (digits) on the keypad or by some other data entry method on a telephone. All such data entry is herein collectively referred to as pressing buttons.

Telephone system 20 includes, for example, a line card 25. Line card 25 serves as an interface between a device handler 21 and telephones 31, 36, 41 and 46. Device handler 21 receives, through line card 25, input from telephones 31, 36, 41 and 46. The input, for example, is information from
5 telephone keypad digits, feature buttons and, so on. Information to process calls, activate features and etc., received by device handler 21 are forwarded to a CPU 22 to be processed. Device handler 21 also forwards information to telephones 31, 36, 41 and 46 for display by displays 32, 37, 42 and 47, respectively.

10 CPU 22 processes input from device handler 21 to create connections between telephones and to activate and deactivate features such as callback and message waiting. In some embodiments of the present invention, CPU 22 can perform the functionality of Device handler 21 so that device handler 21 is not necessary.

15 A switching matrix 26, responsive to CPU 22, implements voice/data connections between telephones for two-party connections. In addition, a conference bridge 24 is used to make connections (talk paths) between a group of telephones, where a group is three or more telephones.

A database 23 is used to store information on each telephone. This
20 information includes, for example, the directory number and a name associated with the directory number. In addition, for current call connections, database 23 holds information about the connection. This includes, for example, an indication of a type of call as well as a listing of the parties to a conference call.

25 A conference can be set up on telephone system 20 in one of a number of standard ways. For example, a user of telephone 31 goes off hook and dials the directory number of telephone 36. For example the user of telephone 31 is Michael Smith at directory number 73733 and the user of telephone 31 is Lee Jones at directory number 73700. When Lee Jones
30 answers telephone 36, switching matrix 26 establishes a two party connection between telephone 31 and telephone 36. CPU 22 stores in database 23 a record of the type of connection (e.g., 2 way) and a listing of the parties to the

connection (Michael Smith at directory number 73733 and Lee Jones at directory number 73700).

To add an additional party, the user of telephone 31 (Michael Smith) presses a FLASH button (e.g., feature button 33) which temporarily places
5 Lee Jones on hold. Michael Smith then dials the directory number of telephone 41. For example, the user of telephone 41 is Carol Burns at directory number 73855. When Carol Burns answers telephone 41, switching matrix 26 establishes a two party connection between telephone 31 and telephone 41. When the user of telephone 31 (Michael Smith) presses a
10 CONFERENCE button (e.g., feature button 34), switching matrix 26 and conference bridge 24 are used to establish a conference between telephone 31, telephone 36 and telephone 41. CPU 22 stores in database 23 a record of the type of connection (e.g., conference) and a listing of the parties to the connection (Michael Smith at directory number 73733, Lee Jones at directory
15 number 73855 and Carol Burns at directory number 73855).

To add another party, the user of telephone 31 (Michael Smith) presses the FLASH button (e.g., feature button 33) which temporarily places Lee Jones and Carol Burns on hold. Michael Smith then dials the directory number of telephone 46. For example, the user of telephone 46 is Robert
20 Jackson at directory number 73800. When Robert Jackson answers telephone 46, switching matrix 26 establishes a two party connection between telephone 31 and telephone 46. When the user of telephone 31 (Michael Smith) presses the CONFERENCE button (e.g., feature button 34), switching matrix 26 and conference bridge 24 are used to establish a conference
25 between telephone 31, telephone 36, telephone 41 and telephone 46. CPU 22 stores in database 23 a record of the type of connection (e.g., conference) and a listing of the parties to the connection (Michael Smith at directory number 73733, Lee Jones at directory number 73855, Carol Burns at directory number 73855 and Robert Jackson at directory number 73800). In
30 Figure 1, conference bridge 24 is shown providing connection for the four-way conference described above.

Figure 2 is a block diagram which shows a conference member 51

(Michael Smith at directory number 73733), a conference member 52 (Lee Jones at directory number 73855), a conference member 53 (Carol Burns at directory number 73855) and a conference member 54 (Robert Jackson at directory number 73800) connected together by a conference 55.

5 Figure 3 shows four entries 60 in database 23 for the four-way conference between Michael Smith at directory number 73733, Lee Jones at directory number 73855, Carol Burns at directory number 73855 and Robert Jackson at directory number 73800. Each entry includes a directory number and a party for the directory number. When constructing entries 60 for the
10 conference call, CPU 22 accesses, for each telephone connected in the conference, the directory number and the party from a section of database 60 which lists directory number and party for each telephone connected to telephone system 20.

Once a conference has been established, the preferred embodiment
15 present invention allows each member of the conference to track who is in the conference and to facilitate party members to contact one another during and after the conference.

For example, parties to the conference, and/or associated directory numbers for each of the parties to the conference may be displayed on one or
20 more of display 32 for telephone 31, display 37 for telephone 36, display 42 for telephone 41 and display 47 for telephone 46. If the displays are large enough, all the parties in the conference can be displayed on each of displays 32, 37, 42 and 47. Alternatively, the parties within a conference may be accessed/displayed by a scroll feature on the telephone.

25 For example in Figure 4, display 32 is shown to include two display lines. Once the conference has been established, the user of telephone 31 (Michael Smith) can scroll through a list of the conference parties by depressing a button (e.g., a conference button, scroll forward button, keypad digit, etc.). For example, when Michael Smith depresses conference button
30 34, the name and directory of a party to the conference is displayed. For example, when Michael Smith is the first member to the conference, the name and directory number for Michael Smith is displayed, as shown in

Figure 5. In an alternative embodiment, each telephone does not display a party and directory number for itself.

The user of telephone 31 (Michael Smith) can scroll through a list of the other conference parties by depressing the appropriate button (e.g., a conference button, scroll forward button, keypad digit, etc.) on telephone 31. Thus when Michael Smith depresses conference button 34, the name and directory number for Lee Jones is displayed, as shown in Figure 6. When Michael Smith again depresses conference button 34, the name and directory number for Carol Burns is displayed, as shown in Figure 7. When Michael Smith depresses conference button 34 another time, the name and directory number for Robert Jackson is displayed, as shown in Figure 8. When Michael Smith depresses conference button 34 another time, the conference party first displayed is displayed again.

In the preferred embodiment of the present invention, CPU 22 of telephone system 20 is responsible to control the contents of displays 32, 37, 42 and 47. When a user of one of telephones 31, 36, 41 or 46 is scrolling through parties of a conference, the depression of the appropriate button (e.g., a conference button, scroll forward button, keypad digit, etc.) is detected by device handler 21 and a message forwarded by device handler 21 to CPU 22. CPU 22 accesses database 23 to obtain from entries 60 (shown in Figure 3) the next entry of entries 60 and forwards the entry through device handler 21 to the appropriate display.

The tracking of parties to a conference in database 23 allows for the implementation of various features. For example, in the preferred embodiment of the present invention, telephone system 20 allows conference members to conduct private consultations during the conference. After privately consulting, the members can rejoin the conference. Additionally, the initiator of the consultation can toggle between the conference and the party with whom the private consultation is held.

Another feature implemented in the preferred embodiment is callback. In this case, a party to the conference selects another telephone user in the conference and selects a feature button which indicates to telephone system

20 that this party is to be automatically called back. Telephone system 20 will automatically execute the callback after both the initiator and the other member have disconnected from the conference, and have gone idle.

Also in the preferred embodiment message waiting is implemented. In
5 this case, a party to the conference selects another telephone user in the conference and selects a feature button which directs telephone system 20 to leave a message waiting indication against a conference member. This can be done without the initiator leaving the conference. The conference member with the message waiting can, when it is convenient, call back the party that
10 left the message waiting. The callback is performed, for example, after the conference is completed.

Also in the preferred embodiment a save re-dial feature is implemented. In this case, a party to the conference selects another telephone user in the conference and selects a feature button which directs
15 telephone system 20 to save the number of the selected conference member for re-dial. This allows the telephone user that initiated the save number re-dial, when it is convenient, to call back the party with the saved directory number. The callback is performed, for example, after the conference is completed.

20 In the preferred embodiment of the present invention, CPU 22 of telephone system 20 is responsible to oversee the implementation of each of the above-described features. For example, in order to implement any of the features, a member of a conference, as described above, selects a party. This is performed, for example, by scrolling through parties of a conference
25 by depressing of the appropriate button (e.g., a conference button, scroll forward button, keypad digit, etc.). This is detected by device handler 21 and a message forwarded by device handler 21 to CPU 22. CPU 22 accesses database 23 to obtain from entries 60 (shown in Figure 3) the next entry of entries 60 and forwards the entry through device handler 21 to the
30 appropriate display.

When a feature button--for example indicating a private consultation, callback, message waiting, save re-dial or some other feature-- is selected,

this is detected by device handler 21 and a message forwarded by device handler 21 to CPU 22. CPU 22 then performs the feature.

For example, when the feature is private consultation, CPU 22 will, during the private consultation, disconnect the two parties from conference
5 bridge 24 and direct switching matrix 24 to execution a two-party connection. During the private consultation, CPU 22 sends a message to the display of both parties indicating that a private consultation is taking place.

For example, Figure 9 illustrates the contents of display 47 of telephone 46, when the telephone user, Robert Jackson, has selected a
10 private consultation feature button 50 after scrolling through the conference members so that conference member Carol Burns was displayed on display 47. Once feature button 50 is selected, display 47 indicates that a private consultation is being held with Carol Burns. During the private consultation, CPU 22 will display on display 42 of telephone 41 the name of Robert
15 Jackson and a message indicating the presence of a private consultation, as illustrated by Figure 10. The private consultation is concluded by Robert Jackson again, for example, by selecting private consultation feature button 50 or by selecting the conference feature button. CPU 22 will then cause switching matrix 26 to re-connect the two parties to conference bridge 24.

20 When the feature is callback, CPU 22 will, in response to the selection of the appropriate feature button, access database 60 for the directory number of the party currently displayed in the telephone display of the initiator. Upon completion of the conference, CPU 22 will, when both telephones are idle, execute the callback.

25 When the feature is message waiting, CPU 22 will, in response to the selection of the appropriate feature button, forward a message waiting signal to the party currently displayed in the telephone display of the initiator. The message waiting signal is, for example, turning on a message waiting light/LED.

30 When the feature is save re-dial, CPU 22 will, in response to the selection of the appropriate feature button, access database 60 for the directory number of the party currently displayed in the telephone display of

the initiator. This directory number is stored in the re-dial memory for the telephone of the initiator.

Claims

What is claimed is

1. A method for implementing telephone features during a conference call comprising the steps of:
 - 5 (a) storing an identity of each party to the conference call;
 - (b) displaying on a display of a first telephone used by a first party to the conference call, an identity of a second party to the conference call; and,
 - (c) in response to selection of a first feature by the first party, implementing the first feature between the first party and the second party.
- 10 2. A method as in claim 1 wherein step (a) includes storing an identity of each party to the conference call within a database within a telephone system.
3. A method as in claim 1 wherein step (b) includes the following substeps:
 - 15 (b.1) in response to the first party depressing a first button on the first telephone, displaying the identity of the second party to the conference; and
 - (b.2) in response to the first party again depressing the first button on the first telephone, displaying an identity of a third party to the conference.
4. A method as in claim 1 wherein in step (c) the first feature is a
20 private consultation between the first party and the second party.
5. A method as in claim 4 wherein step (c) includes the following substeps:
 - (c.1) in response to the first party depressing a consultation feature button on the first telephone,
25 temporarily disconnecting the first party and the second party from the conference call, and
 - temporarily connecting the first party and the second party together in a point-to-point call; and,
 - (c.2) in response to the first party again depressing the consultation
30 feature button on the first telephone,
 - disconnecting the first party and the second party from the point-to-point call, and

connecting the first party and the second party together again to the conference call.

6. A method as in claim 1 wherein in step (c) the first feature is a callback feature between the first party and the second party.

5 7. A method as in claim 6 wherein step (c) includes the following substep:

(c.1) in response to the first party depressing a callback feature button on the first telephone, performing the following substep by a telephone system,

10 upon completion of the conference call and the first telephone being idle and a second telephone for the second party being idle, performing a callback between the first party and the second party.

8. A method as in claim 1 wherein in step (c) the first feature is a message waiting feature indicating to the second party that there is a
15 message waiting from the first party.

9. A method as in claim 1 wherein step (c) includes the following substep:

(c.1) in response to the first party depressing a message-waiting feature button on the first telephone, performing the following substep by a
20 telephone system,

indicating to the second party that there is a message waiting from the first party.

10. A method as in claim 1 wherein in step (c) the first feature is a save re-dial feature which causes the directory number of the second party to
25 be saved in a re-dial memory of the first telephone.

11. A method as in claim 1 wherein step (c) includes the following substep:

(c.1) in response to the first party depressing a save re-dial feature button on the first telephone, performing the following substep by a telephone
30 system,

storing the directory number of the second party in a re-dial memory of the first telephone.

12. A telephone system comprising:

a database in which is stored an identity of each party to a conference call;

display means for displaying on a display of a first telephone used by a first party to the conference call, an identity of a second party to the conference call; and,

feature implementation means for, in response to selection of a first feature by the first party, implementing the first feature between the first party and the second party.

13. A telephone system as in claim 12 wherein the display means, in response to the first party depressing a first button on the first telephone, displays the identity of the second party to the conference and wherein the display means, in response to the first party again depressing the first button on the first telephone, displays an identity of a third party to the conference.

14. A telephone system as in claim 12 wherein the first feature is a private consultation between the first party and the second party.

15. A telephone system as in claim 14 wherein in response to the first party depressing a consultation feature button on the first telephone, the feature implementation means temporarily disconnects the first party and the second party from the conference call, and temporarily connects the first party and the second party together in a point-to-point call, and wherein in response to the first party again depressing the consultation feature button on the first telephone, the feature implementation means disconnects the first party and the second party from the point-to-point call, and connects the first party and the second party together again to the conference call.

16. A telephone system as in claim 12 wherein in response to the first party depressing a callback feature button on the first telephone, the feature implementation means performs a callback between the first party and the second party upon completion of the conference call and the first telephone being idle and a second telephone for the second party being idle.

17. A telephone system as in claim 12 wherein in response to the first party depressing a message waiting feature button on the first telephone, the

feature implementation means indicates to the second party that there is a message waiting from the first party.

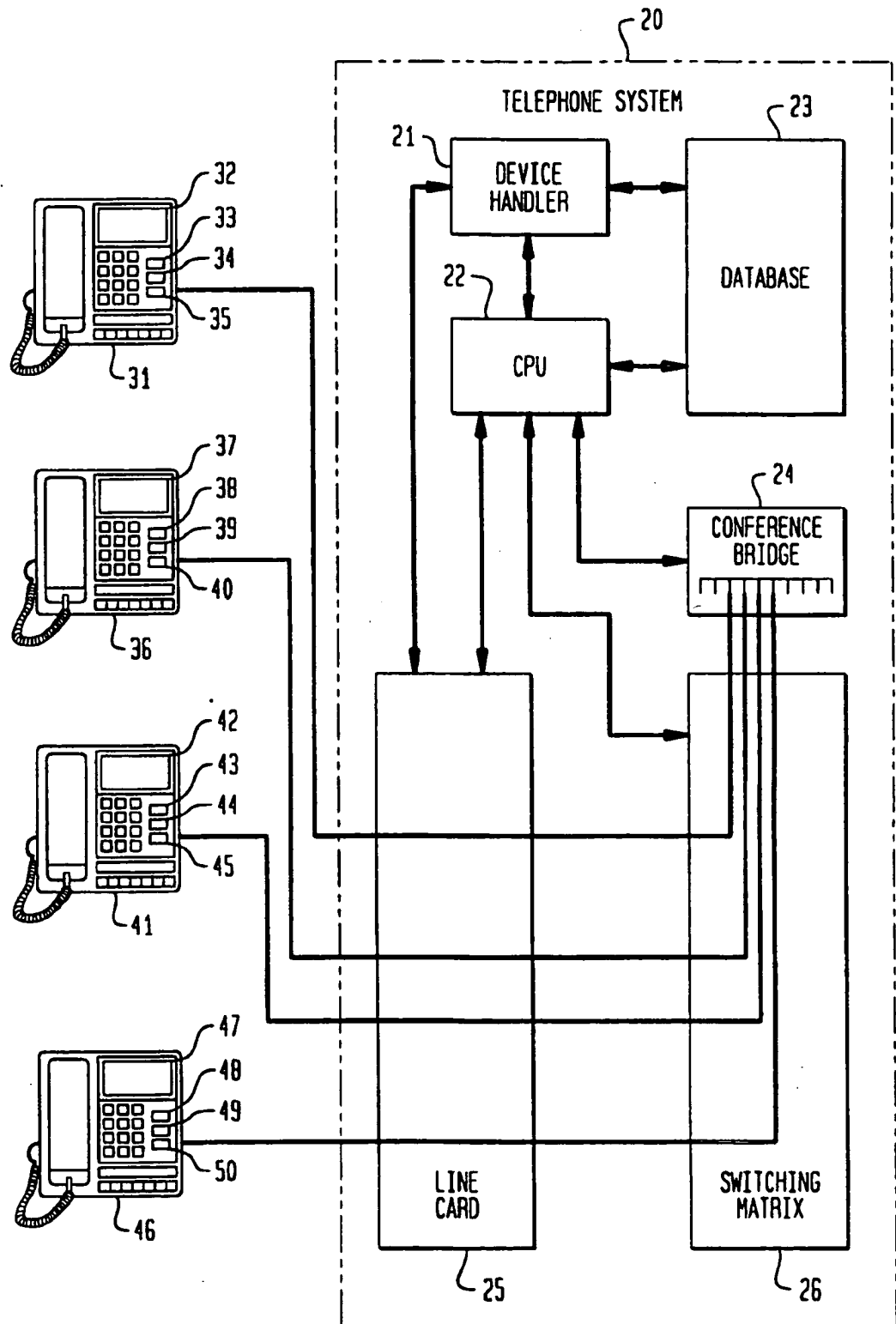
18. A telephone system as in claim 12 wherein in response to the first party depressing a save re-dial feature button on the first telephone, the
5 feature implementation means stores the directory number of the second party in a re-dial memory of the first telephone.

19. A telephone system as in claim 12 wherein the feature implementation means includes a central processing unit and a switching matrix.

- 10 20. A telephone system as in claim 12 wherein the display means includes a central processing unit and a device handler.

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FIG. 1



2/2

FIG. 2

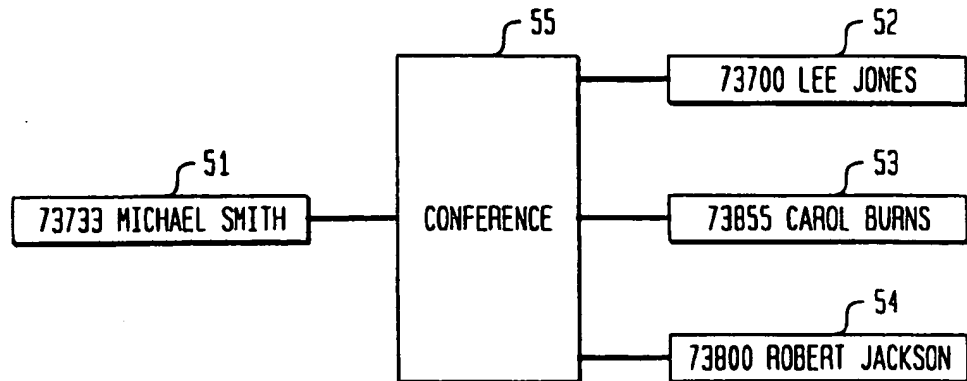


FIG. 3

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